

ABSTRACT OF THE DISCLOSURE

The present invention relates to an aqueous slurry that is particularly useful for removing silicon dioxide in preference to silicon nitride by chemical-mechanical processing. The aqueous slurry according to the invention 5 includes abrasive particles and an organic compound having both a carboxylic acid functional group and a second functional group selected from amines and halides. The present invention also relates to a method of removing silicon dioxide in preference to silicon nitride from a surface of an article by chemical-mechanical polishing. The method includes polishing the surface using a 10 polishing pad, water, abrasive particles, and an organic compound having both a carboxylic acid functional group and a second functional group selected from amines and halides. The abrasive particles can be dispersed in the aqueous medium or they can be bonded to the polishing pad. The aqueous slurry and method of the present invention provide high silicon dioxide to silicon nitride 15 removal rate selectivity over a wide range of pH, which is particularly useful for the fabrication of shallow trench isolation structures on semiconductor devices.

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